#### From the INTERNATIONAL BUREAU

#### **PCT**

#### **NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

To:

United States Patent and Trademark Office (Box PCT) Crystal Plaza 2 Washington, DC 20231 ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year)
21 December 1998 (21.12.98)

in its capacity as elected Office

21 December 1998 (21.12.98)	III its capacity as elected Office		
International application No. PCT/GB98/01587	Applicant's or agent's file reference IES/5782-PCT		
. International filing date (day/month/year) 01 June 1998 (01.06.98)	Priority date (day/month/year) 02 June 1997 (02.06.97)		
Applicant			
CHRISTOU, Victor			

in a notice effecting later election filed with the International Bureau on:  2. The election X was was not made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).		X in the demand filed wi		Preliminary Examining Author		
2. The election X was was not was not made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under			02 De	cember 1998 (02.12.98)	<u> </u>	
was not  made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under		in a notice effecting lat	ter election filed wit	h the International Bureau on	):	
was not  made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under				· · · · · · · · · · · · · · · · · · ·		
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			f 19 months from th	ne priority date or, where Rule	e 32 applies, within th	e time limit under
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The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland

Authorized officer

Carine SEVILLANO

Telephone No.: (41-22) 338.83.38

Facsimile No.: (41-22) 740.14.35

### PATENT COOPERATION TREATY

PCT  NOTIFICATION OF THE RECORDING  OF A CHANGE  (PCT Rule 92bis.1 and	То:
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(PCT Rule 92his 1 and	WILKINSON, Stephen, John
PCT Rule 92his 1 and	Stevens, Hewlett & Perkins
	1 St. Augustines Place Bristol BS1 4UD
Administrative Instructions, Section 422)	ROYAUME-UNI
	NOTACINE_C.
Date of mailing (day/month/year)	
19 May 1999 (19.05.99)	
Applicant's or agent's file reference	IMPORTANT NOTIFICATION
IES/5782-PCT	INFORTAGE ROTHICATION
Later resignation and institution No.	International filing date (day/month/year)
iliternational application 110.	
PC1/GB38/01387	
1. The following indications appeared on record concerning:	
	the agent the common representative
	State of Nationality State of Residence
Name and Address	State of Mationality State of Medical
STEVENS, Ian, Edward	Talanhana No.
Stevens, Hewiett & Perkins 1 St. Augustine's Place	<b>I</b>
Bristol BS1 4UD	
United Kingdom	1
	Teleprinter No.
·	
2. The International Bureau hereby notifies the applicant that the	following change has been recorded concerning:
l	l I I I Aba mandalanan
the person X the name the addre	ess ( the fluttonism)
the person X the name the addre	
Name and Address	
Name and Address WII KINSON, Stephen, John	State of Nationality State of Residence
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place	State of Nationality State of Residence  Telephone No.
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD	State of Nationality State of Residence  Telephone No.  44 117 9226007
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place	State of Nationality State of Residence  Telephone No. 44 117 9226007  Facsimile No.
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD	State of Nationality State of Residence  Telephone No. 44 117 9226007  Facsimile No.
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  4. A copy of this notification has been sent to:  X the receiving Office	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  A copy of this notification has been sent to:  X the receiving Office the International Searching Authority	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.  the designated Offices concerned  X the elected Offices concerned
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  4. A copy of this notification has been sent to:  X the receiving Office	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  4. A copy of this notification has been sent to:  X the receiving Office the International Searching Authority X the International Preliminary Examining Authority	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.  the designated Offices concerned  X the elected Offices concerned  other:
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  4. A copy of this notification has been sent to:  X the receiving Office the International Searching Authority X the International Preliminary Examining Authority  The International Bureau of WIPO	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.  the designated Offices concerned  X the elected Offices concerned other:  Authorized officer
Name and Address  WILKINSON, Stephen, John Stevens, Hewlett & Perkins 1 St. Augustines Place Bristol BS1 4UD United Kingdom  3. Further observations, if necessary:  4. A copy of this notification has been sent to:  X the receiving Office  the International Searching Authority X the International Preliminary Examining Authority	State of Nationality  Telephone No. 44 117 9226007  Facsimile No. 44 117 9226009  Teleprinter No.  the designated Offices concerned  X the elected Offices concerned  other:
PCT/GB98/01587  1. The following indications appeared on record concerning: the applicant the inventor X	01 June 1998 (01.06.98)

Form PCT/IB/306 (March 1994)

002625202

#### ATENT COOPERATION TREAT

From the INTERNIONAL HELIMANARY E	XAMINING AUTHORITY		
To: BRI	STOL		PCT
WILKINSON, Stephen John Stevens Hewlett & Perkins 6 1 St Augustine's Pace Bristol BS1 4UD GRANDE BRETAGNMA.  FILE NO.	SEP 1999	THE INT	ATION OF TRANSMITTAL OF ERNATIONAL PRELIMINARY KAMINATION REPORT (PCT Rule 71.1)
		(day/month/year)	0 3, 09, 99
Applicant's or agent's file reference IES/5782-PCT			MPORTANT NOTIFICATION
International application No. PCT/GB98/01587	International filing date (d 01/06/1998	ay/month/year)	Priority date (day/month/year) 02/06/1997
Applicant ISIS INNOVATION LIMITED et a	al.		

- The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
- 2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
- Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

Authorized officer

European Patent Office D-80298 Munich Borinski, W

Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465

Tel.(+49-89) 2399-8237



Form PCT/IPEA/416 (July 1992)



### INTERNATIONAL SEARCH REPORT

Inte Hal Application No
PCT/GB 98/01587

A. CLASSII IPC 6	FICATION OF SUBJECT MATTER C09K11/06 H05B33/14 C07D401/0	0	
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According to	International Patent Classification (IPC) or to both national classification	on and IPC	
	SEARCHED	and the second s	
Minimum do IPC 6	cumentation searched (classification system followed by classification CO9K H05B CO7D	symbols)	
Documentat	ion searched other than minimum documentation to the extent that suc	h documents are included in the fields sea	rched
Electronic d	ata base consulted during the international search (name of data base	and, where practical, search terms used)	
C. DOCUM	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant	ant passages	Relevant to claim No.
Р,Х	ARMAROLI N ET AL: "Luminescence properties of Eu/sup 3+/, Tb/sup 3 Gd/sup 3+/ complexes of the hexade N-donor podand tris-	B-/, and entate	1-4,11, 12
	3-(2-pyridyl)pyrazol-1ylhydroborat CHEMICAL PHYSICS LETTERS, 26 SEPT ELSEVIER, NETHERLANDS,	. 1997,	
	vol. 276, no. 5-6, pages 435-440 XP002074915 ISSN 0009-2614 see page 435 - page 440	•	
Ρ,Χ	WO 98 06242 A (UNIV PRINCETON ;UN SOUTHERN CALIFORNIA (US)) 12 Februsee the whole document		1-3,8, 10,11
A	WO 93 11433 A (WALLAC OY) 10 June see the whole document	1993	1-23
	ther documents are listed in the continuation of box C.	Patent family members are listed	in annex.
	their documents are assect at the contangation of the co.	<u></u>	
"A" docum	ategories of cited documents:  nent defining the general state of the art which is not idered to be of particular relevance	"I" later document published after the inte or priority date and not in conflict with cited to understand the principle or th invention	the application but
"E" earlier filling	document but published on or after the international date ent which may throw doubts on priority claim(s) or	"X" document of particular relevance; the cannot be considered novel or canno involve an inventive step when the do	t be considered to ocument is taken alone
"O" docum	on or other special reason (as specified) nent referring to an oral disclosure, use, exhibition or	"Y" document of particular relevance; the cannot be considered to involve an ir document is combined with one or ments, such combination being obvious.	iventive step when the ore other such docu-
"P" docum	r means nent published prior to the international filing date but than the priority date claimed	in the art. "&" document member of the same patent	
	a actual completion of the international search	Date of mailing of the international se-	arch report
	24 August 1998	03/09/1998	
Name and	mailing address of the ISA  European Patent Office, P.B. 5818 Patentiaan 2	Authorized officer	
	NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo ni, Fax: (+31-70) 340-3016	Drouot, M-C	

1

Information on patent family members

Inte onal Application No PCT/GB 98/01587

Patent document cited in search report		Publication dat		atent family member(s)	Publication dat
WO 9806242	Α	12-02-1998	AU	3805297 A	25-02-1998
WO 9311433	Α	10-06-1993	EP US	0626068 A 5571897 A	30-11-1994 05-11-1996

### PATENT COOPERATION TREATY

## **PCT**

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

• •	r agent's file reference		See Notification of Transmittal of International FOR FURTHER ACTION Preliminary Examination Report (Form PCT/IPEA/416)		
IES/5782-			Priority date (day/month/year)		
	application No.	International filing date (day/month/year) 01/06/1998	02/06/1997		
PCT/GB9			0200/100/		
International C09K11/0	Patent Classification (IPC) or na 6	ational dassification and IPC			
Applicant		•			
ISIS INNO	OVATION LIMITED et al.				
1. This in and is	ternational preliminary exam transmitted to the applicant	nination report has been prepared by thi according to Article 36.	is International Preliminary Examining Authority		
2. This R	EPORT consists of a total of	f 4 sheets, including this cover sheet.	,		
be	en amended and are the ba	ed by ANNEXES, i.e. sheets of the desc usis for this report and/or sheets contain 607 of the Administrative Instructions un	cription, claims and/or drawings which have ning rectifications made before this Authority nder the PCT).		
These	annexes consist of a total o	f 2 sheets.			
3. This re	eport contains indications rel	lating to the following items:			
	_				
; []					
111	•	opinion with regard to novelty, inventive	e step and industrial applicability		
١٧	☐ Lack of unity of invent				
v	☑ Reasoned statement   ■ Property    ■ Property    ■ Property    ■ Property    ■ Property		ty, inventive step or industrial applicability;		
VI	☐ Certain documents ci				
VII	☐ Certain defects in the	international application			
VIII		on the international application			
Date of sub	mission of the demand	Date of comple	etion of this report		
02/12/19	98	0	3. 09. 99		
Name and		nal Authorized offi	icar (2013A).		
	mailing address of the internation examining authority:	iai , maioni i i i i i i i i i i i i i i i i i i	September 1		
	European Patent Office D-80298 Munich	Russell, G	(* <b>)</b> )		
	Tel. (+49-89) 2399-0 Tx: 5236	SS6 epmu d	2 Reg. 17 Dens: 1771		
	Fax: (+49-89) 2399-4465	I Telephone No	(+49-89) 2399 8738		

# INTER: .TIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01587

I. Basis	of the	he r	port
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1. This report has been drawn on the basis of (substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):

	the i	report since they d	o not contain amendments.):	•		
	Des	cription, pages:				
	1-25		as originally filed			
	Clai	ms, No.:				
	1-10	,16-20	as originally filed			
	11-1	5,21-23	as received on	05/06/1999	with letter of	02/06/1999
	Dra	wings, sheets:				
	1/3-	3/3	as originally filed			
2.	The	amendments have	e resulted in the cancellation of:			
		the description,	pages:			
		the claims,	Nos.:			
		the drawings,	sheets:			
3.		This report has be considered to go	een established as if (some of) t beyond the disclosure as filed (l	he amendme Rule 70.2(c)):	nts had not been made	e, since they have been
4.	Ado	litional observatior	ns, if necessary:			

## INTERI .TIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01587

- V. Reasoned statement und r Article 35(2) with r gard to novelty, inv ntive step or industrial applicability; citations and explanations supporting such statement
- 1. Statement

Novelty (N) Yes: Claims 1-23

No: Claims

Inventive step (IS) Yes: Claims 1-23

No: Claims

Industrial applicability (IA) Yes: Claims 1-23

No: Claims

2. Citations and explanations

see separate sheet

# INTL..NATIONAL PRELIMINARY International application No. PCT/GB98/01587 EXAMINATION REPORT - SEPARATE SHEET

#### Paragraph V:

1. Relevant cited prior art:

D3 WO-A-93 11 433

2. The disclosure D3 relates to luminescent lanthanide comprising a lanthanide ion and a chelate. The chelator comprises three unsaturated heterocyclic rings covalently coupled to each other and additionally two chelating groups. The structure of the heterocyclic rings is formed from either one 2,6-pyridylene and two five-membered unsaturated heterocyclic ring moieties or two 2,6-pyridylene and one five-membered unsaturated heterocyclic ring moiety. 1,3-pyrazolylene is among the list of possible heterocyclic five-membered rings (claim 1; Examples 17, 18; Compounds 17, 18). Trispyrazolylborates ligands are not disclosed. The chelate forms in which the chelate groups together with the heterocyclic ring structure are chelated/complexed to the lanthanide ion. Example 18 describes an europium(III) chelate wherein the chelate ligand comprises two pyrazolyl groups in which one nitrogen atom of the pyrazolyl moiety forms a coordinate bond to the metal.

The chelates are useful as probes in time-resolved fluorescence microscopy, cytometry, multilabelling techniques and in process controls in industry. Their application in light emitting devices is not disclosed or suggested.

Therefore, the subject-matter of claims 1 to 23 fulfills the requirements of Articles 33(2) and 33(3) PCT.



11. Organometallic complex having the formula (I)

 $[(Z (L)_3)_p M] A_q$ 

wherein Z, p, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, L, A, q and M are as defined in claim 3 and:

 $R^4$  and/or  $R^2$  is  $-(CX_2)_nX$  wherein n is 0 or a positive integer from 1 to 6 and X is halogen; or  $R^4$  is orthodihalogenated or orthodiperhalomethylated aryl, optionally further substituted on the aryl ring; or

 ${\sf R}^2$  and  ${\sf R}^3$  or  ${\sf R}^3$  and  ${\sf R}^4$  are linked so as to form a fused aromatic or non-aromatic ring system with the pyrazolyl ring of L.

- 12. Complex as claimed in claim 11, wherein M is Tb, Ce, Eu, Er, Gd, Tm, Sm or Nd.
- 13. Complex as claimed in claim 11 or claim 12, wherein R<sup>4</sup> is trifluoromethyl.
- 14. Complex as claimed in any one of claims 11 to 13, wherein R<sup>3</sup> is hydrogen and R<sup>2</sup> is trifluoromethyl.
- 15. Complex as claimed in any one of claims 11 to 14, wherein Z is H-B.



- 21. Light emitting material comprising an organometallic complex either as a film or dispersed within a matrix, the organometallic complex being a complex according to claim 11, wherein the ligands are optionally fluorinated and are arranged about the metal such that there are no carbon-hydrogen bonds within 5Å of the metal centre.
- 22. Light emitting material as claimed in claim 21, wherein the ligands are tridentate and there are two ligands per metal ion in the complex.
- 23. Light emitting material as claimed in either claim 21 or claim 22, wherein the complex is a complex according to any one of claims 12 to 17.

#### **PATENT COOPERATION TREATY**

## **PCT**

#### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference		of Transmittal of International Search Report
IES/5782-PCT	ACTION (FORM PC 17/15AV2	220) as well as, where applicable, item 5 below.
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)
PCT/GB 98/01587	01/06/1998	02/06/1997
Applicant		
ISIS INNOVATION LIMITE	et al.	
	been prepared by this International Searching Aut ng transmitted to the International Bureau.	nority and is transmitted to the applicant
This International Search Report con	sists of a total of2 sheets. I copy of each priorart document cited in this report	
Certain claims were found	d unsearchable (see Box I).	
2. Unity of invention is lacki	ing(see Box II).	
	n contains disclosure of a <b>nucleotide and/or amin</b> rried out on the basis of the sequence listing	o acid sequence listing and the
	filed with the international application.	
	furnished by the applicant separately from the inte	• • • • • • • • • • • • • • • • • • • •
	but not accompanied by a statement to the matter going beyond the disclosure in the	
	Transcribed by this Authority	-
4. With regard to the <b>title,</b> χ	the text is approved as submitted by the applicant	
	the text has been established by this Authority to re	
5. With regard to the abstract,		
	the text is approved as submitted by the applicant the text has been established, according to Rule 3	
	Box III. The applicant may, within one month from Search Report, submit comments to this Authority	the date of mailing of this International
6. The figure of the <b>drawings</b> to be	published with the abstract is:	
Figure No	as suggested by the applicant.	None of the figures.
	because the applicant failed to suggest a figure.	
	because this figure better characterizes the invention	on.

#### INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 98/01587

		<del></del>	
A. CLASS	ification of subject matter C09K11/06 H05B33/14 C07D401/	′00	
According t	o International Patent Classification (IPC) or to both national classifica	ation and IPC	
B. FIELDS	SEARCHED		
Minimum do	ocumentation searched (classification system followed by classification CO9K H05B CO7D	on symbols)	
Documenta	tion searched other than minimumdocumentation to the extent that su	uch documents are included in the fields sea	ched
Electronic d	fata base consulted during the international search (name of data bas	se and, where practical, search terms used)	
C. DOCUM	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the rele	ovant passages	Relevant to claim No.
Р,Х	ARMAROLI N ET AL: "Luminescence properties of Eu/sup 3+/, Tb/sup Gd/sup 3+/ complexes of the hexad N-donor podand tris-3-(2-pyridyl)pyrazol-lylhydrobora	lentate	1-4,11, 12
	CHEMICAL PHYSICS LETTERS, 26 SEPT ELSEVIER, NETHERLANDS, vol. 276, no. 5-6, pages 435-440 XP002074915 ISSN 0009-2614 see page 435 - page 440		
Ρ,Χ	WO 98 06242 A (UNIV PRINCETON ;UN SOUTHERN CALIFORNIA (US)) 12 Febr see the whole document		1-3,8, 10,11
A	WO 93 11433 A (WALLAC OY) 10 June see the whole document	9 1993	1-23
Furt	her documents are listed in the continuation of box C.	X Patent family members are listed in	annex.
° Special ca	ategories of cited documents :	"T" later document published after the interr	ational filing date
consid	ent defining the general state of the art which is not dered to be of particular relevance	or priority date and not in conflict with t cited to understand the principle or the invention	he application but bry underlying the
filing of "L" docume	date ant which may throw doubts on priority claim(s) or to sited to exhibit the stabilistic date of specific	"X" document of particular relevance; the classification cannot be considered novel or cannot be involve an inventive step when the doc	oe considered to ument is taken alone
citation	n or other special reason (as specified) ent referring to an oral disclosure, use, exhibition or	"Y" document of particular relevance; the cla cannot be considered to involve an involve document is combined with one or mor	entive step when the e other such docu-
"P" docume	means ent published prior to the international filing date but han the priority date claimed	ments, such combination being obvious in the art.  "&" document member of the same patent for	
Date of the	actual completion of theinternational search	Date of mailing of the international search	ch report
2	4 August 1998	03/09/1998	
Name and r	mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2	Authorized officer	
	NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Drouot, M-C	

#### INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 98/01587

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9806242 A	12-02-1998	AU 3805297 A	25-02-1998
WO 9311433 A	10-06-1993	EP 0626068 A US 5571897 A	30-11-1994 05-11-1996

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#### 11. Organometallic complex having the formula (I)

 $[(Z (L)_3)_p M] A_q$ (I)

wherein Z, p, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, L, A, q and M are as defined in claim 1 and:

R<sup>4</sup> and/or R<sup>2</sup> is -(CX<sub>2</sub>)<sub>n</sub>X wherein n is 0 or a positive integer from 1 to 6 and X is halogen; or R<sup>4</sup> is orthodihalogenated or orthodiperhalomethylated aryl, optionally further substituted on the aryl ring; or

 $R^2$  and  $R^3$  or  $R^3$  and  $R^4$  are linked so as to form a fused aromatic or non-aromatic ring system with the pyrazolyl ring of L.

- 12. Complex as claimed in claim 10, wherein M is Tb, Ce, Eu, Er, Gd, Tm, Sm or Nd.
- 13. Complex as claimed in claim 11 or claim 12, wherein R<sup>4</sup> is trifluoromethyl.
- 14. Complex as claimed in any one of claims 11 to 13, wherein R<sup>3</sup> is hydrogen and R<sup>2</sup> is trifluoromethyl.
- 15. Complex as claimed in any one of claims 11 to 14, wherein Z is H-B.

- 21. Light emitting material comprising an organometallic complex either as a film or dispersed within a matrix, the organometallic complex being a complex of a trivalent lanthanide metal with from 1 to 3 ligands wherein the ligands are optionally fluorinated and are arranged about the metal such that there are no carbon-hydrogen bonds within 5Å of the metal centre.
- 22. Light emitting material as claimed in claim 21, wherein the ligands are tridentate and there are two ligands per metal ion in the complex.
- 23. Light emitting material as claimed in claim 21 or claim 22, wherein the complex is a complex of any one of claims 11 to 17.

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### PATENT COOPERATION TREATY

**PCT** 

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#### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference IES/5782-PCT			FOR FURTHER ACTION  See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)							
•			International filing date (day/month	n/vear)	Priority date (day/month/year)					
International application No. PCT/GB98/01587			01/06/1998	uyear,	02/06/1997					
		ent Classification (IPC) or na			102001001					
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Applicant										
1 ''	101/4	TION LIMITED et al.								
1919 1141	IOVA	TION LIMITED et al.								
				by this Inte	ernational Preliminary Examining Authority					
andi	s tran	smitted to the applicant a	ccording to Article 36.							
2. This	2. This REPORT consists of a total of 4 sheets, including this cover sheet.									
	This re	eport is also accompanied	d by ANNEXES, i.e. sheets of the	e descriptio	n, claims and/or drawings which have					
t	een a	amended and are the bas	is for this report and/or sheets c	ontaining re	ctifications made before this Authority					
(	see F	Rule 70.16 and Section 60	07 of the Administrative Instruction	ons under th	ne PC1).					
Thes	e ann	exes consist of a total of	2 sheets.							
3. This	report	contains indications rela	ting to the following items:							
1	$\boxtimes$	Basis of the report								
11		Priority								
111		Non-establishment of or	oinion with regard to novelty, inv	entive step	and industrial applicability					
IV		Lack of unity of inventio	n							
٧	×		ider Article 35(2) with regard to r ns suporting such statement	novelty, inve	entive step or industrial applicability;					
VI		Certain documents cite								
VII		Certain defects in the in	_							
VIII			the international application							
Date of sub	missio	on of the demand	Date of c	ompletion of	this report					
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02/12/1998				0 3. 09. 99						
Name and	Name and mailing address of the international			ed officer	CEDES a.					
preliminary examining authority:										
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Fax: (+49-89) 2399-4465 Telephone No. (+49-89) 2399 8738										

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01587

I.	Basis of the report									
i.	This report has been drawn on the basis of (substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):									
	Description, pages:									
	1-2	5	as originally filed							
	Claims, No.:									
	1-10,16-20		as originally filed							
	11-	15,21-23	as received on	05/06/1999	with letter of	02/06/1999				
	Drawings, sheets:									
	1/3-3/3 as		as originally filed							
2.	. The amendments have resulted in the cancellation of:									
		the description,	pages:							
		the claims,	Nos.:							
		the drawings,	sheets:							
3.	☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):									
4.	Add	itional observations	s, if necessary:							

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01587

- V. R asoned stat ment under Articl 35(2) with regard to nov Ity, inv ntive step r industrial
- · applicability; citations and explanations supporting such statement
- 1. Statement

. Novelty (N)

Yes:

Claims 1-23

No:

Claims

Inventive step (IS)

Yes: Claims 1-23

No: Claims

Industrial applicability (IA)

Yes:

Claims 1-23

No: Claims

2. Citations and explanations

see separate sheet

#### Paragraph V:

1. Relevant cited prior art:

D3 WO-A-93 11 433

2. The disclosure **D3** relates to luminescent lanthanide comprising a lanthanide ion and a chelate. The chelator comprises three unsaturated heterocyclic rings covalently coupled to each other and additionally two chelating groups. The structure of the heterocyclic rings is formed from either one 2,6-pyridylene and two five-membered unsaturated heterocyclic ring moieties or two 2,6-pyridylene and one five-membered unsaturated heterocyclic ring moiety. 1,3-pyrazolylene is among the list of possible heterocyclic five-membered rings (claim 1; Examples 17, 18; Compounds 17, 18). Trispyrazolylborates ligands are not disclosed. The chelate forms in which the chelate groups together with the heterocyclic ring structure are chelated/complexed to the lanthanide ion. Example 18 describes an europium(III) chelate wherein the chelate ligand comprises two pyrazolyl groups in which one nitrogen atom of the pyrazolyl moiety forms a coordinate bond to the metal.

The chelates are useful as probes in time-resolved fluorescence microscopy, cytometry, multilabelling techniques and in process controls in industry. Their application in light emitting devices is not disclosed or suggested.

Therefore, the subject-matter of claims 1 to 23 fulfills the requirements of Articles 33(2) and 33(3) PCT.